Electrical Contractors Take a Proactive Approach to Maintenance with Digital Technologies

In the world of electrical contracting, being proactive rather than reactive can minimize downtime and maximize profitability. New digital technologies — mobile apps integrated with augmented reality (AR), monitoring control systems, energy management systems, and human machine interface devices (HMIs) — are helping contractors work smarter, not harder, in today's growing U.S. electrical market.

By remotely monitoring electrical equipment, electrical contractors can gain a clear view of their system remotely from their phone, tablet, or PC, said Mike Hoppe, U.S. electrification product marketing director — digital portfolio for ABB. When a problem is detected in the electrical system, they can receive alerts, notifications, and text messages, allowing them to stay ahead of costly issues.

In the first part of this series, "Digital Technologies Drive Productivity and Safety in the Electrical Construction Market," we discussed how electricians can use ABB's EPiC mobile app, which integrates AR to work safely outside the arc flash zone to commission breakers.

Another type of technology, virtual reality (VR), places workers in virtually created environments and allows them to view an equipment lineup. One day, it may give them a full-scale view of what they're about to work on, Hoppe said.

"I think virtual reality really speaks to how electricians, engineers, or operation facilities managers may work with their equipment in the future," he said. "You'll be able to create simulations in that equipment without being on-site and without doing anything to the equipment itself."

In Part 2 of our series, we are focusing on additional advancements in tools like HMIs. This technology for visualizing electrical equipment now goes beyond simple touch screens with one-line diagrams. New HMIs can directly facilitate device communications to electrical controls, energy management, and building management systems. In turn, this eliminates the need for additional communications devices and extra hardware like gateways.

"We've introduced devices that combine software and replace multiple pieces of hardware providing a total solution in a single package," Hoppe said.

Mike Hoppe
Product Marketing Director, Digital Portfolio, ABB
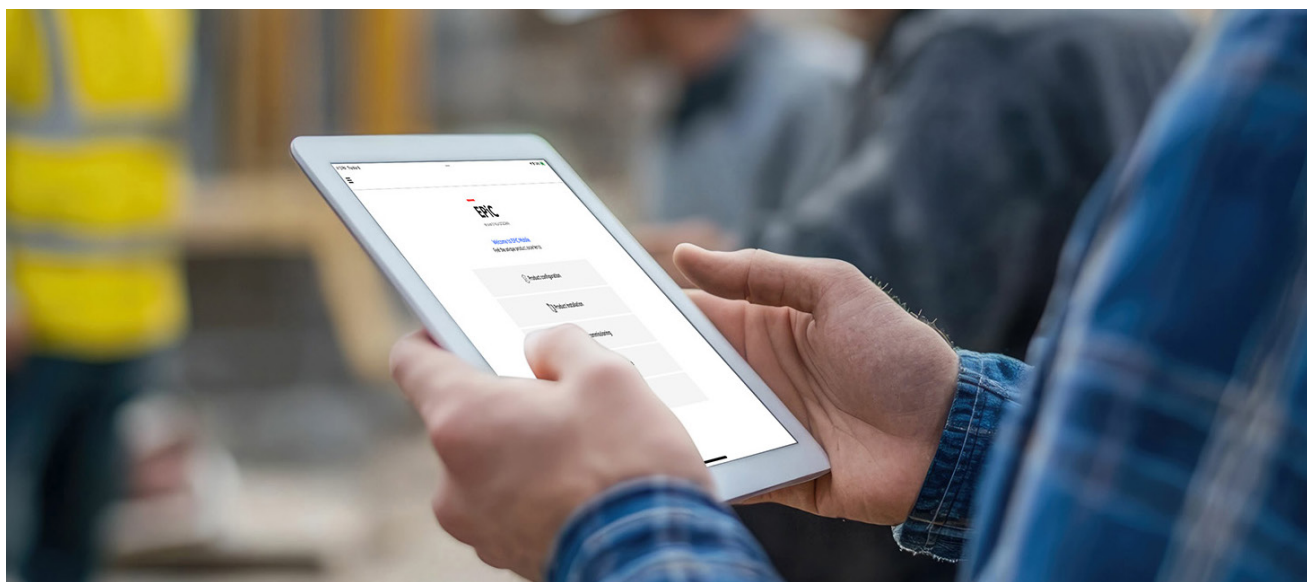
Streamlining HMI Technology

Recently, new developments have emerged in HMI technology that can capture what three different pieces of hardware or devices once did individually. This took up space in the switchgear or panel. Traditionally, contractors had to figure out where to place a communications gateway or additional devices in an equipment lineup. If they didn't fit, they would have to position them on the wall or on a desk.

"We've eliminated that by essentially putting them into a single device — a new HMI that would sit in the switchboard panel or the switchgear," Hoppe said. "It allows automatic detection of any ABB device and also third-party devices."

With the HMI, ABB can incorporate the communications gateway, which is critical for connecting breakers and switches and allowing them to communicate data to the SCADA system. The HMI would also allow templates that could be easily configured and connected to these devices.

"What you're doing is essentially allowing them to communicate the data so important things like voltage, current, power, temperature, and humidity can be communicated to any control system, energy management system, or building management system," he said. "It would allow you to connect virtually to any third-party system for monitoring and control."

Previously, these HMIs were purely a visual way to see the system and know what devices were connected in the system. Traditionally, the HMIs did not facilitate or act as a hub. Today, the HMI can be a three-in-one device that serves as the brain inside the equipment to facilitate communication.

The HMI can communicate directly to the EPiC mobile app and energy management system, allowing users to receive either a text message or a visual alert. They could then access the system remotely, knowing exactly what part of the system or component may have an issue.

"That could be a failure or a minor issue, but you'll be able to know the difference before arriving on-site, so I think that's key," he said.

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Enhancing Safety

The new HMIs allow electricians and field technicians to have a high level of situational awareness, which can further enhance safety.

"If you're on-site, standing in front of that equipment lineup, you'll be able to visually see what is happening," Hoppe said. "On that diagram, it will show where the alerts are in the system and point you to the appropriate breaker."

More importantly, electrical contractors can perform that work remotely. Case in point: On a recent site visit to Florida, Hoppe visited a switchgear lineup with the control or operations center in a separate room behind a concrete wall. That way, if something failed, it was designed so an arc flash wouldn't penetrate the wall, and the workers would be safe.

"The best option is if you don't have to be there at all, and if something were to happen, hopefully not catastrophic, you'd be able to tap into this particular HMI or hub using your phone, tablet, or computer, and you could access the system," Hoppe said.

When contractors check their system using their energy management or control system for monitoring, they can connect with the HMI to gain visibility and a high-level view of the equipment from a remote location.

"You can improve your situational awareness because you essentially have visibility at all times," he said. "If there's an alert telling you that something is going to happen to a particular asset or piece of equipment at a given point in time, you can either replace or fix it."

For electrical contractors, the new digital technologies provide assurance that they can get ahead of any problems and make sure their customers will be online. Time is money in today's rapidly growing U.S. electric market, and by taking a proactive approach, electrical contractors can improve both productivity and safety in the workplace.

For more information about ABB's digital solutions, visit https://electrification.us.abb.com/powertoinform.